Alberta traffic collision statistics

1989

Safety in Motion

Alberta

ALBERTA TRAFFIC COLLISION STATISTICS 1989

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1989 Overview

- The number of traffic **fatalities increased 5.0%** over the past year from 464 deaths in 1988 to 487 deaths in 1989.
- The number of **traffic injuries increased 5.2%** over the past year from 18,777 injuries in 1988 to 19,753 in 1989.
- The number of **traffic collisions increased 9.2%** over the past year from 110,264 collisions in 1988 to 120,364 in 1989.
- **More fatal collisions** occurred between **July and October.**
- **Friday** was the most collision-prone day of the week. However, the majority of fatal collisions occurred on Saturday.
- The most collision-prone period of time was the **afternoon rush-hour.**
- **Casualty rates** were highest for persons between the **ages of 15 and 24.**
- **Male drivers** between the **ages of 16 and 19** were most likely to be involved in casualty collisions.
- **Driver error** was recorded for 53.3% of drivers involved in casualty collisions.
- **Fatal collisions** occurred most frequently in **rural areas,** whereas **injury and property damage only collisions** occurred more frequently in **urban areas.**
- Based on **motorcycle** registrations, the involvement rate of motorcycles in fatal collisions decreased to a **five year low.**
- **25.0% of drivers** involved in **fatal crashes had consumed alcohol prior to the crash** compared to **9.5% of drivers in injury crashes.**
- As the percentage of seat belt use **increased,** the severity of occupant injury **decreased.**

Preface

The purpose of this report is to provide an overview of the "who", "what", "when", "where", "why", and "how" of traffic collisions which occurred in Alberta during 1989. Although the report is general in nature, it pays particular attention to casualty collisions, that is, those collisions which resulted in death or injury. Since 1984, limited information is collected for crashes involving only property damage.

Legislation in Alberta requires that a traffic collision, which results in either death, injury or property damage to an apparent extent of $500.00 or more, be reported immediately to an authorized peace officer. The officer completes a standardized collision report form which provides information on various aspects of the traffic collision. This report is based on the data collected from these report forms.

The collision report form is issued with standard instructions to every police force within Alberta, to be completed by the officer attending the scene of a motor vehicle crash. Police priorities at the scene of a crash are to care for the injured, protect the motoring public and clear the roadway. Completion of the collision report form is a secondary, but necessary task.

After completion, the information on the collision report form is coded for input to computer files. The Provincial Traffic Crash Information System, which has been operational since 1978, undergoes several manual and computerized inspections each year in order to ensure maximum accuracy of the final data output.

Due to continuing police investigation, some numbers presented in this report may be subject to revision. It should also be noted that not all percentage columns will total 100 due to rounding error. However, the patterns and trends detailed in this report represent an accurate description of Alberta's traffic collision picture.

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Glossary

Alcohol Impaired - In the judgement of the police officer, driving ability was impaired by alcohol consumption. Whether or not the subject was actually charged is not taken into consideration by the collision report form.

Casualty Collision - A vehicle collision which results in either a fatality or personal injury.

Drinking Driver - Refers to those drivers judged by the police officer, as having been drinking prior to the crash or as being alcohol impaired at the time of the crash. Whether or not the driver was actually charged is not taken into consideration by the collision report form.

Fatality - A fatality is a death of a person that occurs as a result of a motor vehicle collision within 30 days of the collision.

Had Been Drinking - In the judgement of the police officer, the driver had recently consumed alcohol but his driving ability was not obviously impaired.

Major Injury - Persons with injuries or complaint of pain that went to the hospital and were subsequently admitted even if for observation only.

Minor Injury - Persons with injuries or complaint of pain that went to the hospital, were treated in emergency (or refused treatment) and SENT HOME without ever being admitted to the hospital.

Motorcyclist - Refers to drivers and passengers of motorcycles.

Occupant Casualties - Refers to people who were injured or killed as a result of a vehicle collision and were identified as being either a vehicle driver or passenger.

Property Damage Only - A vehicle collision which resulted in property damage only exceeding $500.00.

Reportable Collision A vehicle collision which resulted in death, injury or property damage greater than $500.00.

Rural - Any area outside of that defined as 'urban'.

Urban - Any area within the corporate boundaries of a city, town, or village.

1989 Traffic Collision Summary

Introduction

During 1989, 120,364 collisions were recorded on Alberta roadways. Property damage only crashes (over $500) represented 88.7% (106,722) of this total while 11.0% (13,234) were non-fatal injury collisions. Fatal crashes accounted for less than 0.3% (408) of the total reported collisions.

Five Year Trends

The fatal collision rate in terms of 10,000 population, rose in 1989 to 1.7 after recording a five year low of 1.6 in 1988. The fatality rate has followed the same pattern. In terms of 10,000 population the rate rose to 2.0 in 1989 after a low of 1.9 in 1988.

Non-fatal injury collision rates and non-fatal injury rates increased in 1986, but fell again in 1987 and 1988. In 1989, the non-fatal injury collision rate, in terms of 10,000 population, has risen to 54.5.

In terms of 10,000 population, property damage and total collision rates now stand at 439.3 and 495.5, respectively. These rates are at a five year high.

Provincial Comparisons

In order to get a clear picture of Alberta's traffic injuries, in comparison to other provinces, rates rather than absolute numbers are utilized. In this instance, rates per 10,000 population were examined.

In 1989, only one province, New Brunswick, recorded a higher fatality rate than Alberta in terms of 10,000 population.

Table 1.1

Alberta Traffic Collisions
1985 - 1989

Severity of Collision	1989	1988	1987	1986	1985
Fatal Collisions	408	395	425	430	432
Non-Fatal Injury Collisions	13234	12728	13088	14383	12733
Property Damage Only Collisions	106722	97141	83980	82372	85224
Total Reportable Collisions	**120364**	**110264**	**97493**	**97185**	**98389**
Number Killed	487	464	510	523	533
Number Injured	19753	18777	19809	22148	19855
Total Number of Casualties	**20240**	**19241**	**20319**	**22671**	**20388**

Observations

In 1989, the overall number of collisions increased 9.2% when compared to 1988. In 1989, injury collisions increased 4.0% while fatal crashes increased 3.3%. The number of fatalities has increased by 5.0% from 1988 to 1989, and the number of injuries increased by 5.2%. In terms of the past five years, overall collisions decreased from 1985 to 1986, and increased from 1987 to 1989.

Table 1.2

Alberta Traffic Collision Rates
1985-1989

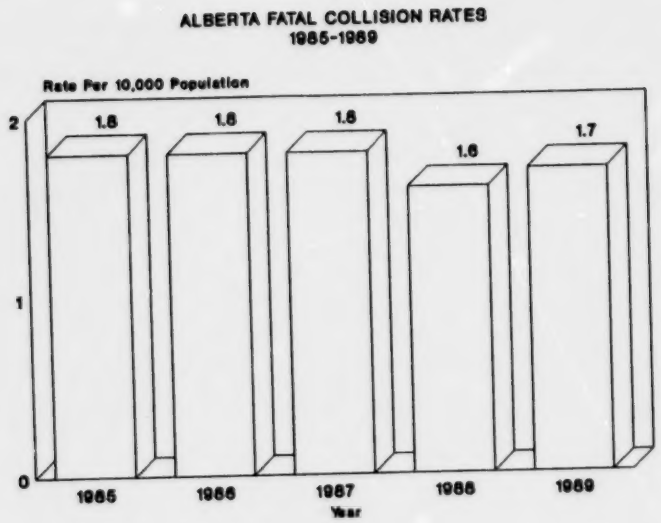
	Rate Per 10,000 Population*					Rate Per 10,000 Licenced Drivers*					Rate Per 10,000 Registered Vehicles*				
	1989	1988	1987	1986	1985	1989	1988	1987	1986	1985	1989	1988	1987	1986	1985
Fatal Collisions	1.7	1.6	1.8	1.8	1.8	2.2	2.2	2.3	2.4	2.4	2.2	1.8	2.0	**	**
Number Killed	2.0	1.9	2.1	2.2	2.3	2.6	2.6	2.8	2.9	3.0	2.7	2.2	2.4		
Non-Fatal Injury Collisions	54.5	53.1	55.0	60.3	54.2	71.4	70.0	72.3	78.9	70.8	72.7	59.1	61.9		
Number Injured	81.3	78.4	83.2	92.9	84.5	106.6	103.2	109.4	121.5	110.5	108.5	87.2	93.7		
Property Damage Only Collisions	439.3	405.6	352.8	345.4	362.8	575.7	533.9	464.0	452.0	474.2	586.4	451.3	397.1		
Total Reportable Collisions	**495.5**	**460.4**	**409.6**	**407.5**	**418.8**	**649.3**	**606.1**	**538.7**	**533.4**	**547.4**	**661.4**	**512.2**	**461.0**		

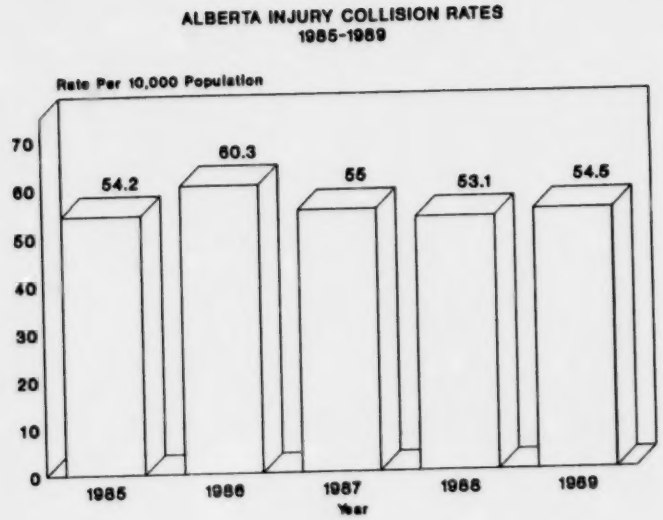
Observations

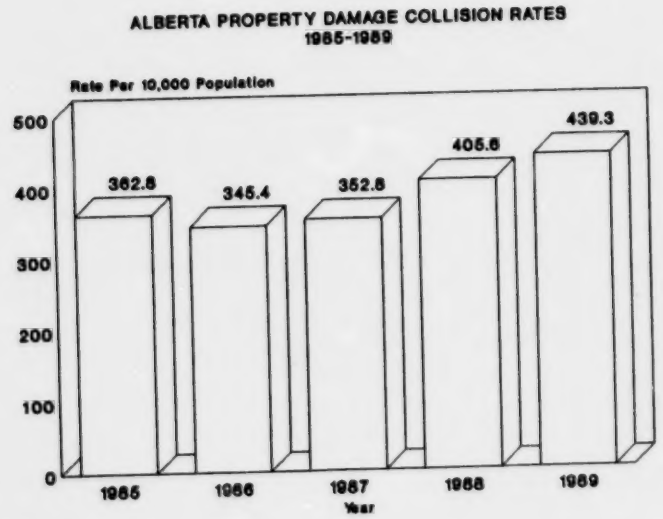
Fatal collision rates in terms of population and licenced drivers remained constant until 1987, dropping slightly in 1988, and rising again in 1989. In 1989 the non-fatal injury collision rate increased over 1988, as did property damage and total collision rates.

*Sources:
Licenced Drivers - Operator Statistics, Motor Vehicles Division, Alberta Solicitor General, December 31, 1989.
Population - Estimate, as of June 1, 1989, Statistics Canada.
Registered Vehicles - Motor Vehicles Division, Alberta Solicitor General, March 31, 1989.

** Data for 1985 -1986 is not comparable to 1987-1989 and therefore is not included in this table.


ALBERTA FATAL COLLISION RATES
1985-1989
Rate Per 10,000 Population
2
1
0
1.8
1.8
1.8
1.6
1.7
1985
1986
1987
1988
1989
Year


ALBERTA INJURY COLLISION RATES
1985-1989
Rate Per 10,000 Population
70
60
50
40
30
20
10
0
54.2
60.3
55
53.1
54.5
1985
1986
1987
1988
1989
Year


ALBERTA PROPERTY DAMAGE COLLISION RATES
1985-1989
Rate Per 10,000 Population
500
400
300
200
100
0
362.8
345.4
352.8
405.6
439.3
1985
1986
1987
1988
1989
Year

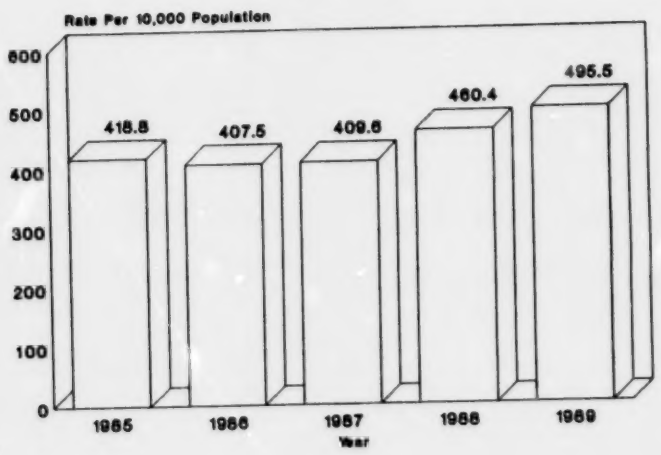

ALBERTA OVERALL COLLISION RATES
1985-1989
Rate Per 10,000 Population
600
500
400
300
200
100
0
418.8
407.5
409.6
460.4
495.5
1985
1986
1987
1988
1989
Year

Figure 1

Table 1.3

Provincial Comparison of Casualty Rates Per 10,000 Population
1985-1989

	1989		1988		1987		1986		1985	
	Fatal	Injury	Fatal	Injury	Fatal	Injury	Fatal	Injury	Fatal	Injury
Alberta	2.0	81.3	1.9	78.4	2.1	83.3	2.2	93.3	2.3	84.5
British Columbia	1.9	155.4	2.1	148.0	2.1	141.2	2.1	139.8	1.7	119.7
Saskatchewan	1.9	80.8	2.0	86.3	2.3	89.9	2.4	87.4	2.1	83.9
Manitoba	1.4	122.9	1.3	110.6	1.5	110.6	1.6	105.9	1.3	100.4
Ontario	*	*	*	*	1.3	130.7	1.2	119.4	1.3	121.2
Quebec	1.7	84.9	1.6	89.2	1.7	91.1	1.6	89.1	2.1	94.7
New Brunswick	2.1	105.0	2.3	99.3	2.1	96.2	1.8	88.2	2.0	80.8
Nova Scotia	1.4	68.7	1.7	62.4	1.8	64.5	1.5	57.7	1.8	60.5
Prince Edward Island	1.4	76.1	1.6	73.8	1.4	78.2	2.3	63.6	2.9	70.0
Newfoundland	1.6	56.0	1.0	57.5	1.0	53.6	1.0	45.8	1.2	44.8

Observations

During 1989, for the provinces where information was available, only one province, New Brunswick, recorded a higher fatality rate than Alberta. Four provinces, Saskatchewan, Nova Scotia, Prince Edward Island, and Newfoundland recorded a lower rate of non-fatal injuries per 10,000 population.

Sources: Casualty statistics supplied by each province. Population estimates, as of June 1, 1989, Statistics Canada.

* Not available at time of printing.

PROVINCIAL TRAFFIC FATALITY RATES
Per 10,000 Population
1989

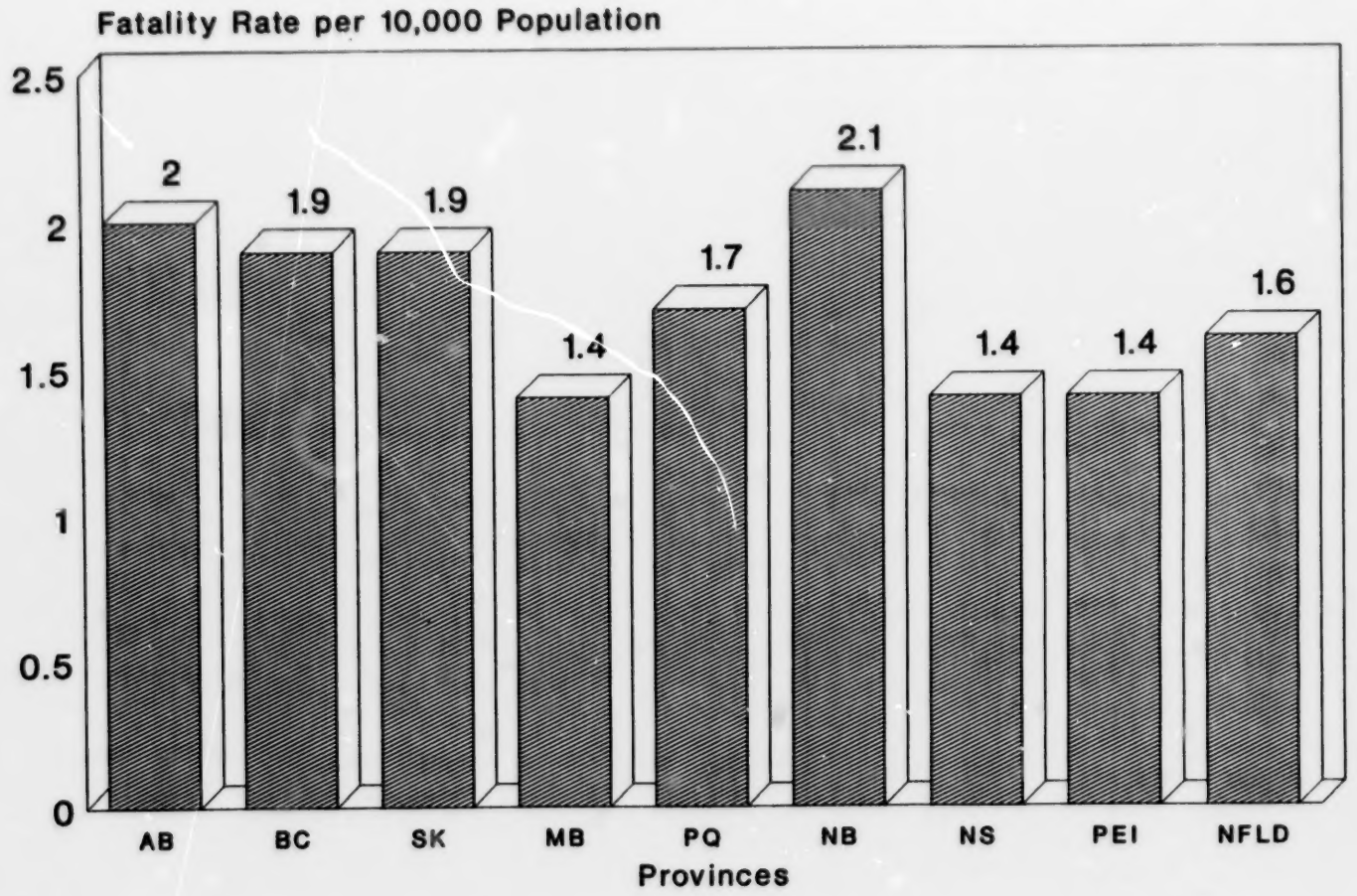


Figure 2

When the Collisions Occurred

Month

The months of July and November experienced more casualty collisions than other months. The highest number of property damage only collisions was recorded during the month of November.

Day of Week

The daily distribution of collisions indicated that Friday was the most collision - prone day of the week. The largest number of fatal crashes occurred on Saturday.

Time

The afternoon rush hour period (3:00 p.m. - 6:59 p.m.) accounted for the highest proportion of collisions. The least collision - prone time period was the early morning (3:00 a.m. - 6:59 a.m.).

Holidays

The four day Remembrance Day long weekend period recorded the greatest number of traffic collisions for a holiday period in 1989. The 1989 August long weekend recorded the highest total number of deaths.

Table 2.1

Collision Occurrence by Month
1989

Month	Fatal Collisions N	Fatal Collisions %	Non-Fatal Injury Collisions N	Non-Fatal Injury Collisions %	Property Damage Only Collisions N	Property Damage Only Collisions %	Total Collisions N	Total Collisions %
January	21	5.1	976	7.4	10778	10.1	11775	9.8
February	22	5.4	918	6.9	11348	10.6	12288	10.2
March	23	5.6	905	6.8	8919	8.4	9847	8.2
April	24	5.9	878	6.6	6473	6.1	7375	6.1
May	30	7.4	1043	7.9	7325	6.9	8398	7.0
June	31	7.6	1233	9.3	7802	7.3	9066	7.5
July	48	11.8	1250	9.4	7953	7.5	9251	7.7
August	53	13.0	1234	9.3	7570	7.1	8857	7.4
September	40	9.8	1206	9.1	7850	7.4	9096	7.6
October	47	11.5	1154	8.7	8311	7.8	9512	7.9
November	32	7.8	1263	9.5	11708	11.0	13003	10.8
December	37	9.1	1174	8.9	10684	10.0	11895	9.9
Unspecified	-	-	-	-	1	0.0	1	0.0
Total Number of Collisions	**408**	**100.0**	**13234**	**100.0**	**106722**	**100.0**	**120364**	**100.0**

Observations

The months of July, August and October experienced the most fatal crashes. The months of July and November experienced more non-fatal injury collisions than other months. The highest number of property damage only collisions was reported in the month of November.

Table 2.2

Collision Occurrence by Day of Week
1989

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Day of Week	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Monday	41	10.0	1746	13.2	14631	13.7	16418	13.6
Tuesday	45	11.0	1809	13.7	15540	14.6	17394	14.5
Wednesday	46	11.3	1809	13.7	16188	15.2	18043	15.0
Thursday	56	13.7	1869	14.1	15836	14.8	17761	14.8
Friday	66	16.2	2346	17.7	18763	17.6	21175	17.6
Saturday	83	20.3	2051	15.5	15180	14.2	17314	14.4
Sunday	71	17.4	1604	12.1	10584	9.9	12259	10.2
Total Number of Collisions	**408**	**100.0**	**13234**	**100.0**	**106722**	**100.0**	**120364**	**100.0**

Observations

The daily distribution of collisions indicated that overall Friday was the most collision-prone day of the week, followed by Wednesday and Thursday. However, the largest number of fatal crashes occurred on Saturday.

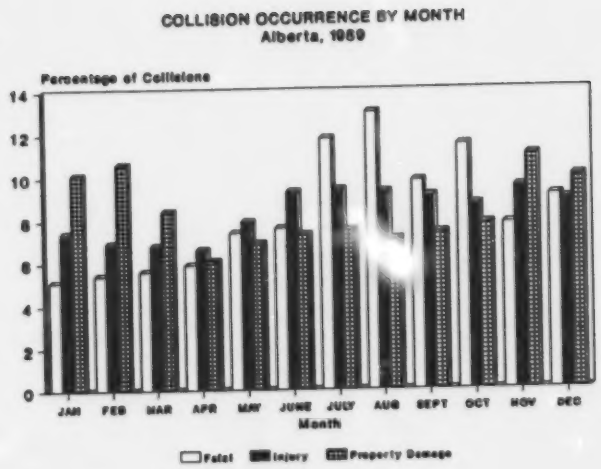
Table 2.3

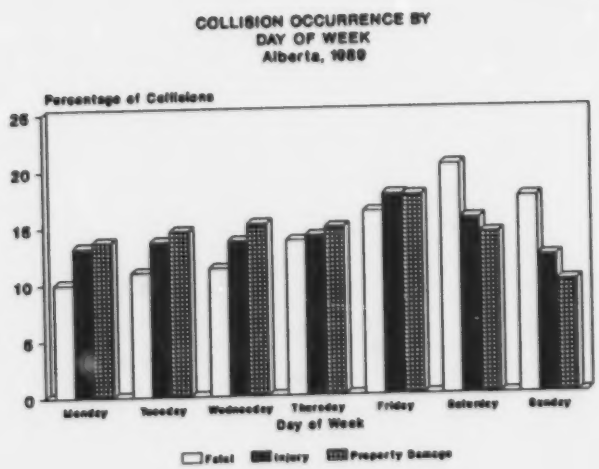
Collision Occurrence by Time Periods
1989

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Time Period	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
11:00 p.m.- 2:59 a.m.	74	18.1	1325	10.0	9052	8.5	10451	8.7
3:00 a.m. - 6:59 a.m.	38	9.3	745	5.6	4574	4.3	5357	4.5
7:00 a.m. - 10:59 a.m.	67	16.4	2067	15.6	17969	16.8	20103	16.7
11:00 a.m. - 2:59 p.m.	63	15.4	2754	20.8	25284	23.7	28101	23.3
3:00 p.m. - 6:59 p.m.	86	21.1	3934	29.7	30096	28.2	34116	28.3
7:00 p.m. - 10:59 p.m.	75	18.4	2214	16.7	17221	16.1	19510	16.2
Unspecified	5	1.2	195	1.5	2526	2.4	2726	2.3
Total Number of Collisions	**408**	**100.0**	**13234**	**100.0**	**106722**	**100.0**	**120364**	**100.0**

Observations

The afternoon rush hour period (3:00 p.m. - 6:59 p.m.) accounted for the largest percentage (28.3%) of collisions occurring in a 24 hour period. The least collision - prone time period was the early morning (3:00 a.m. - 6:59 a.m.).


COLLISION OCCURRENCE BY MONTH
Alberta, 1989
Percentage of Collisions
14
12
10
8
6
4
2
0
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
Month
Fatal
Injury
Property Damage


COLLISION OCCURRENCE BY
DAY OF WEEK
Alberta, 1989
Percentage of Collisions
25
20
15
10
5
0
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Day of Week
Fatal
Injury
Property Damage

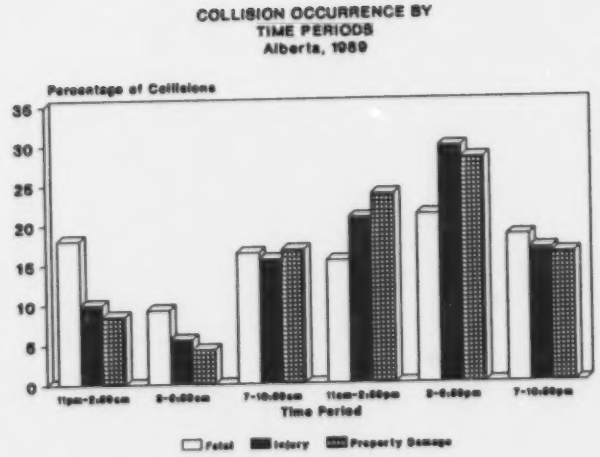

COLLISION OCCURRENCE BY
TIME PERIODS
Alberta, 1989
Percentage of Collisions
35
30
25
20
15
10
5
0
11pm-2:59am
3-6:59am
7-10:59am
11am-2:59pm
3-6:59pm
7-10:59pm
Time Period
Fatal
Injury
Property Damage

Figure 3

Table 2.4

Collisions During 1989 Holidays

Holidays	Number Killed N	Number Injured N	Total Collisions* N
New Year's Day (January 1)	0	28	269
Easter (March 23- 27)	4	222	1279
Victoria Day (May 19-22)	6	275	1057
Canada Day (June 30 - July 3)	7	302	1160
August Long Weekend (August 4-7)	18	278	958
Labour Day (September 1-4)	12	252	1232
Thanksgiving (October 6-9)	12	238	1020
Remembrance Day (November 10-13)	4	238	2080
Christmas Season (December 22-26)	15	252	1405
Total	**78**	**2085**	**10460**

Observations

The four-day August long weekend period recorded the highest number of individuals killed. The four day Remembrance Day weekend period recorded the highest number of total collisions.

* Total includes fatal, injury, and property damage only collisions.

Victims

Road User Class

The majority of traffic victims were drivers and passengers of vehicles. Pedestrians and motorcyclists accounted for 6.2% and 3.2% of the total casualties, respectively.

Age of Casualties

Casualty rates per 10,000 population were highest for persons between the ages of 15 and 24. The lowest casualty rates were recorded for children 14 and under and people 65 years of age and over.

Table 3.1

Injuries and Fatalities by Road User Class
1989

Road User Class	Persons Killed		Persons Injured		Total Casualties	
	N	%	N	%	N	%
Drivers	255	52.4	10681	54.1	10936	54.0
Passengers	149	30.6	6552	33.2	6701	33.1
Pedestrians	59	12.1	1192	6.0	1251	6.2
Motorcyclists	10	2.1	636	3.2	646	3.2
Bicyclists	5	1.0	625	3.2	630	3.1
Other	5	1.0	49	0.2	54	0.3
Unspecified	4	0.8	18	0.1	22	0.1
Total Casualties	**487**	**100.0**	**19753**	**100.0**	**20240**	**100.0**

Observations

The majority of traffic victims were drivers and passengers of vehicles. Pedestrians and motorcyclists accounted for 6.2% and 3.2% of the total casualties, respectively.

Table 3.2

Age of Casualties
1989

Age In Years	Persons Killed N	Persons Killed %	Persons Injured N	Persons Injured %	Casualty Rate Per 10,000 Population*
Under 5	13	2.7	428	2.2	21.4
5 - 9	13	2.7	736	3.7	39.1
10 - 14	14	2.9	824	4.2	47.9
15 - 19	60	12.3	3410	17.3	191.1
20 - 24	55	11.3	3151	16.0	163.1
25 - 29	47	9.7	2626	13.3	111.9
30 - 34	45	9.2	2000	10.1	85.1
35 - 44	71	14.6	2656	13.4	73.4
45 - 54	46	9.4	1430	7.2	64.0
55 - 64	46	9.4	1031	5.2	59.0
65 and over	77	15.8	1024	5.2	51.6
Unspecified	-	-	437	2.2	
Total Casualties	**487**	**100.0**	**19753**	**100.0**	

Observations

Casualty rates per 10,000 population were highest for persons between the ages of 15 and 24. The lowest casualty rates were recorded for children (14 years of age and younger) and people 65 and over.

* Based on estimates of the Alberta population by age groups and sex, June 1, 1990, Statistics Canada.

AGE OF CASUALTIES
CASUALTY RATE PER 10,000 POPULATION
Alberta, 1989

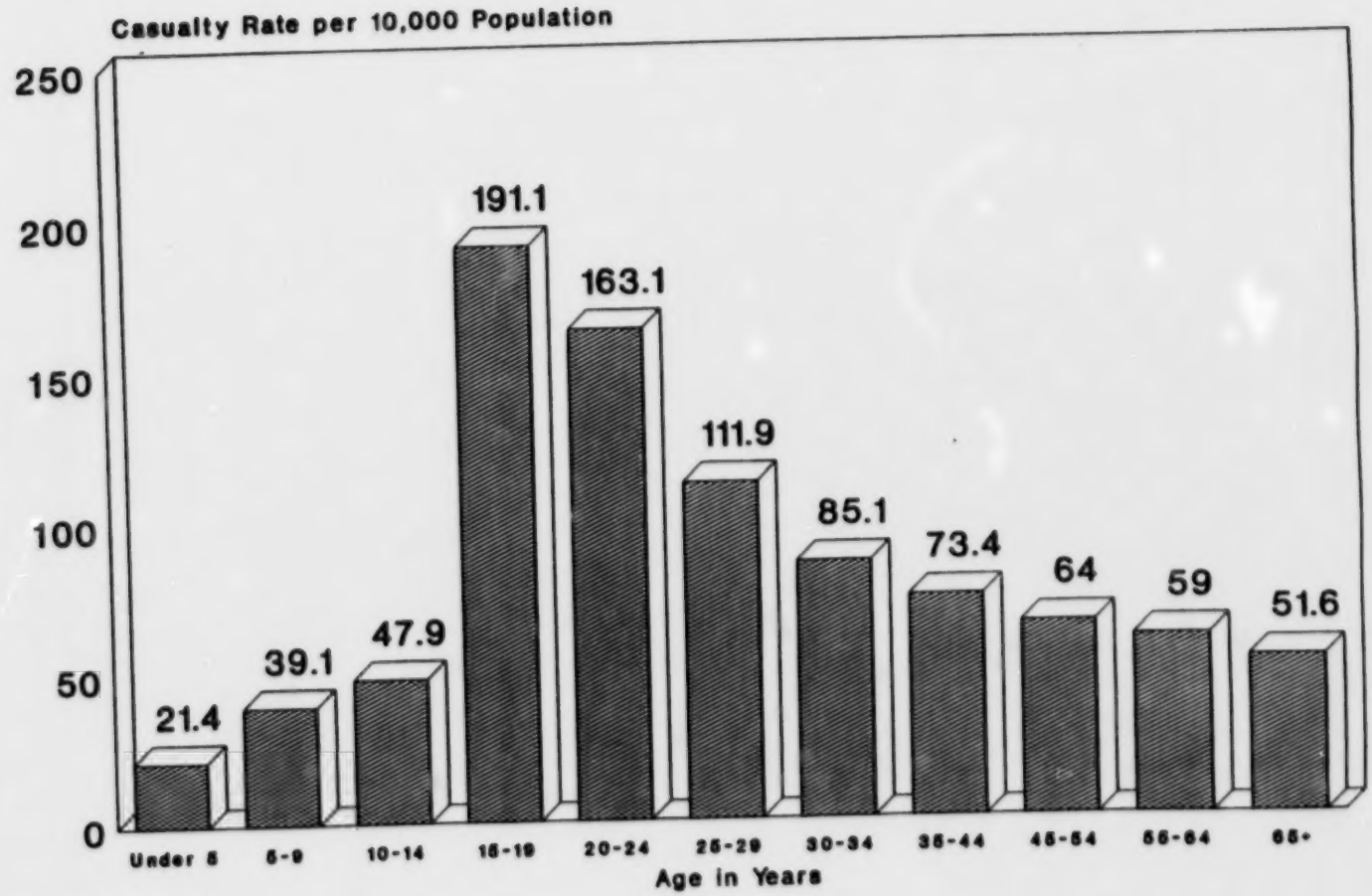


Figure 4

Driver Component

Age and Sex of Drivers

Collision rates per 1000 licensed drivers indicated that 16-19 year olds were more likely to be involved in a casualty collision than any other age group.

Driver Actions

Driver error or misjudgment was cited for approximately 53.3% of the drivers involved in casualty collisions. Running off the road, failing to observe a traffic control device and travelling at an unsafe speed were the most frequent driver actions contributing to casualty collisions.

Table 4.1

Age and Sex of Drivers Involved in Casualty Collisions:
Per 1,000 Licensed Drivers
1989

	Males			Females			Total*		
Age of Driver	N	%	Per 1000** Licensed Drivers	N	%	Per 1000** Licensed Drivers	N	%	Per 1000** Licensed Drivers
Under 16	306	1.3	19.1	135	0.6	11.5	447	1.9	16.1
16 - 17	860	3.7	29.0	460	2.0	18.4	1326	5.7	24.3
18 - 19	1223	5.3	31.6	578	2.5	17.3	1804	7.8	25.0
20 - 24	2578	11.2	24.0	1164	5.0	12.0	3748	16.2	18.3
25 - 34	4450	19.3	15.3	2053	8.9	7.9	6535	28.3	11.9
35 - 44	2604	11.3	11.8	1376	6.0	7.2	3999	17.3	9.7
45 - 54	1427	6.2	11.1	676	2.9	6.3	2113	9.2	9.0
55 - 64	1012	4.4	10.5	408	1.8	5.8	1423	6.2	8.5
65 and over	828	3.6	10.5	287	1.2	5.6	1121	4.9	8.6
Unspecified	158	0.7		74	0.3		575	2.5	
TOTAL Number of Drivers	**15446**	**67.0**		**7211**	**31.2**		**23091**	**100.0**	

Observations

Collision rates per 1000 licensed drivers indicated that 18-19 year olds were more likely to be involved in a casualty collision than any other age group. The next age group most likely to be involved in casualty crashes was 16 to 17 year olds.

*Total includes drivers whose sex was not specified on the collision report form.

**Source: Alberta Solicitor General - Motor Vehicles Division. Operator Statistics, December 31, 1989.

AGE AND SEX OF DRIVERS INVOLVED IN CASUALTY COLLISIONS, Alberta 1989 COLLISION RATE PER 1000 LICENSED DRIVERS

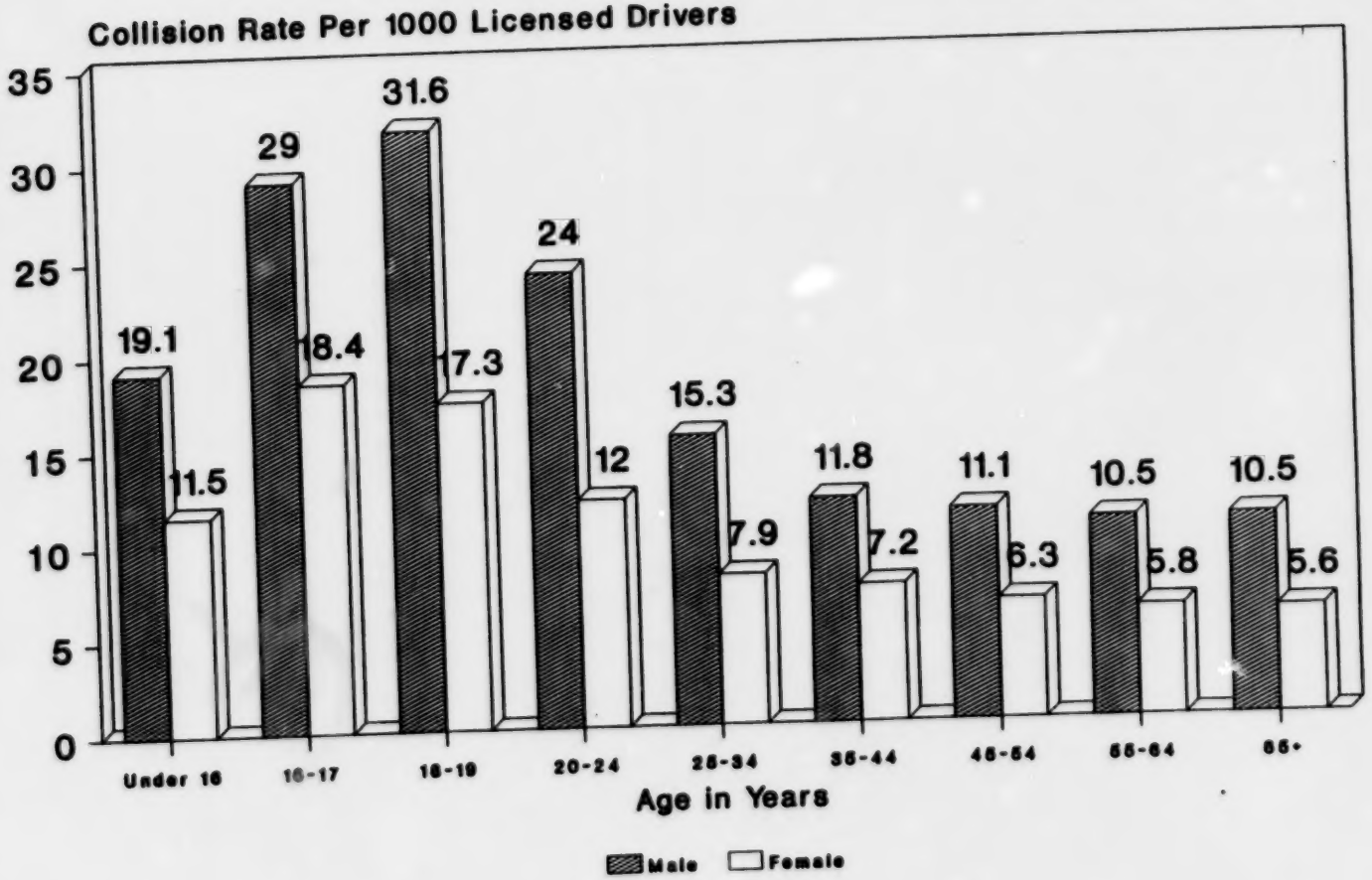


Figure 5

Table 4.2

Actions of Drivers Involved in Casualty Collisions*
1989

Driver Action	Drivers in Fatal Collisions		Drivers in Non-Fatal Injury Collisions		Total Drivers in Casualty Collisions	
	N	%	N	%	N	%
Driving Properly	274	42.2	9690	46.8	9964	46.7
Ran Off Road	88	13.6	1444	7.0	1532	7.2
Failed to Observe Traffic Control Device	54	8.3	1255	6.1	1309	6.1
Unsafe Speed	42	6.5	1221	5.9	1263	5.9
Followed Too Closely	8	1.2	1203	5.8	1211	5.7
Left Turn Across Path	17	2.6	1053	5.1	1070	5.0
Failed to Yield Right-of-Way	25	3.9	1011	4.9	1036	4.9
Entered Lane When Unsafe	8	1.2	451	2.2	459	2.1
Left of Center	79	12.2	248	1.2	327	1.5
Improper Turn	3	0.5	323	1.6	326	1.5
Improper Passing	13	2.0	135	0.7	148	0.7
Backed Unsafely	-	-	130	0.6	130	0.6
Failed to Signal	-	-	15	0.1	15	0.1
Other	38	5.9	2522	12.2	2560	12.0
Total Number of Drivers	**649**	**100.0**	**20701**	**100.0**	**21350**	**100.0**

Observations

Driver error or misjudgment was cited for 53.3% of drivers involved in casualty collisions. Running off the road, failing to observe traffic control device, and travelling at an unsafe speed were the most frequently identified driver actions contributing to casualty collisions.

*Based on those cases where driver action was specified on the collision report form.

Vehicle Component

Types of Vehicles

Passenger cars and pick up trucks/vans were the vehicles most frequently involved in total casualty collisions. Motorcycles were involved in 2.5% of casualty collisions and bicycles were involved in 2.7% of casualty collisions.

Vehicular Factors

Vehicle defects played a minor role in casualty collisions. Only 2% of vehicles involved in casualty collisions were identified as having a vehicle defect. The most common defects involved tire failure and defective brakes.

Point of Impact

The most common point of impact in casualty collisions involved the front of the vehicle. Approximately 39% of the impacts involved the center front.

Table 5.1

Types of Vehicles Involved in Casualty Collisions*
1989

Type of Vehicle	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Total Vehicles in Casualty Collisions	
	N	%	N	%	N	%
Passenger Car	326	48.8	14626	63.9	14952	63.6
Pickup Truck / Van	227	34.0	5824	25.4	6051	25.7
Bicycle	5	0.7	628	2.7	633	2.7
Motorcycle	12	1.8	586	2.6	598	2.5
Truck 4000kg+	33	4.9	567	2.5	600	2.5
Tractor - Trailer	51	7.6	383	1.7	434	1.8
Other Bus	4	0.6	114	0.5	118	0.5
Off Highway Vehicle	3	0.4	36	0.2	39	0.2
School Bus	5	0.7	42	0.2	47	0.2
Farm Equipment	2	0.3	18	0.1	20	0.1
Other	-	-	64	0.3	64	0.3
Total Number of Vehicles	**668**	**100.0**	**22888**	**100.0**	**23556**	**100.0**

Observations

Passenger cars and pickup trucks/vans were the vehicles most frequently involved in total casualty collisions. Overall, motorcycles were involved in 2.5% and bicycles in 2.7% of casualty collisions. Tractor-trailers were involved in 1.8% of total casualty crashes, but in 7.6% of fatal crashes.

* Based on those cases where type of vehicle was specified on the collision report form.

Table 5.2

**Vehicular Factors Involved in Casualty Collisions*
1989**

Vehicular Factors	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Total Vehicles in Casualty Collisions	
	N	%	N	%	N	%
No Defect Present	539	96.6	19684	98.1	20223	98.0
Tire Failure/Inadequate	2	0.4	92	0.5	94	0.5
Defective Brakes	4	0.7	86	0.4	90	0.4
Lighting Defect	4	0.7	41	0.2	45	0.2
Other	9	1.6	167	0.8	176	0.9
Total Number of Vehicles	**558**	**100.0**	**20070**	**100.0**	**20628**	**100.0**

Observations

Vehicle defects played a minor role in casualty collisions. Only 2% of vehicles involved in these types of collisions were identified as having a vehicle defect. The most common defects included tire failure and defective brakes.

* Based on those cases where a vehicle factor was specified on the collision report form.

Table 5.3

Point of Impact on Vehicles Involved in Casualty Collisions*
1989

Point of Impact	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Total Vehicles in Casualty Collisions	
	N	%	N	%	N	%
Center Front	281	42.8	8365	38.9	8646	39.1
Right Front	33	5.0	2246	10.5	2279	10.3
Left Front	61	9.3	2137	9.9	2198	9.9
Right Side	50	7.6	1181	5.5	1231	5.6
Left Side	61	9.3	1242	5.8	1303	5.9
Center Rear	21	3.2	3008	14.0	3029	13.7
Right Rear	18	2.7	641	3.0	659	3.0
Left Rear	19	2.9	628	2.9	647	2.9
Top	1	0.2	47	0.2	48	0.2
Undercarriage	5	0.8	128	0.6	133	0.6
Rollover	106	16.2	1860	8.7	1966	8.9
Total Number of Vehicles	**656**	**100.0**	**21483**	**100.0**	**22139**	**100.0**

Observations

The most common point of impact in casualty collisions involved the front of the vehicle. Approximately 39% of the impacts involved the center front, while 13.7% of the impacts involved the center rear and 10.3% involved the right front.

*Based on those cases for which the point of impact was specified on the collision report form.

Environmental Component

Location

The majority of fatal crashes occurred in rural areas, whereas the majority of injury and property damage only crashes occurred in urban areas.

Surface Condition

The majority (52.2%) of casualty collisions occurred when surface conditions were dry. Snow/ice were present in 22.1% of the casualty crashes.

Road Location

Approximately 47.4% of casualty collisions were intersection-related. However, fatal collisions were more likely to be non-intersection related (61.3%).

Table 6.1

Location of Collisions
1989

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Location	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Urban	123	30.1	9436	71.3	87696	82.2	97255	80.8
Rural	285	69.9	3798	28.7	19026	17.8	23109	19.2
Total Number of Collisions	**408**	**100.0**	**13234**	**100.0**	**106722**	**100.0**	**120364**	**100.0**

Observations

Collisions which occurred in rural areas accounted for 69.9% of all fatal crashes. Collisions occurring in urban areas resulted in the highest proportion of non-fatal injury collisions (71.3%) and property damage only crashes (82.2%).

Table 6.2

Casualty Collision Occurrence by Surface Condition
1989

Surface Condition	Fatal Collisions N	Fatal Collisions %	Non-Fatal Injury Collisions N	Non-Fatal Injury Collisions %	Total Casualty Collisions N	Total Casualty Collisions %
Dry	221	54.2	6901	52.1	7122	52.2
Snowy/Icy	91	22.3	2921	22.1	3012	22.1
Wet	47	11.5	1805	13.6	1852	13.6
Loose Material	33	8.1	597	4.5	630	4.6
Other	2	0.5	53	0.4	55	0.4
Unspecified	14	3.4	957	7.2	971	7.1
Total Number of Collisions	**408**	**100.0**	**13234**	**100.0**	**13642**	**100.0**

Observations

The majority of casualty collisions occurred when surface conditions were dry. Snow and ice were involved in 22.3% of fatal collisions and 22.1% of non-fatal injury collisions.

Table 6.3

Road Location of Casualty Collisions
1989

Road Location	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
	N	%	N	%	N	%
Intersection Related	115	28.2	6349	48.0	6464	47.4
Non-Intersection Related	250	61.3	5842	44.1	6092	44.7
At/Near Entrance to Private Property	15	3.7	342	2.6	357	2.6
Parking Lot	2	0.5	267	2.0	269	2.0
At/Near Commercial Entrance	7	1.7	237	1.8	244	1.8
At/Near Service Road	2	0.5	101	0.8	103	0.8
At/Near Railroad Crossing	14	3.4	56	0.4	70	0.5
Off Highway	3	0.7	32	0.2	35	0.3
Unspecified	-	-	8	0.1	8	0.1
Total Number of Collisions	**408**	**100.0**	**13234**	**100.0**	**13642**	**100.0**

Observations

47.4% of casualty collisions were intersection-related. Fatal collisions were more likely to be non-intersection related (61.3%).

Special Types of Vehicles

Motorcycles

- Based on motorcycle registrations, the involvement rate of motorcycles in fatal collisions decreased to a five year low.
- The majority of motorcycle casualty collisions involved male drivers. Motorcycle drivers under the age of 25 were the age group most likely to be involved in these collisions. In particular 16 and 17 year old motorcycle drivers had an involvement rate per 1,000 licenced drivers of 82.4, a rate over six and a half times greater than that of the 20-24 year old motorcycle drivers.
- Compared to drivers involved in all types of vehicle collisions, motorcycle drivers were less likely to fail to yield right-of-way, fail to observe a traffic control device, or make a left turn across the path of an oncoming vehicle. However, motorcycle drivers were more likely to drive at an unsafe speed, run off the road, or pass improperly.
- Compared to drivers involved in all types of vehicle casualty collisions, motorcycle drivers were more likely to have consumed alcohol before the crash.
- Vehicular factors were involved in 4.0% of motorcycle casualty collisions compared to 2.0% of casualty collisions involving all types of vehicles.
- The majority of casualty collisions involving motorcycles occurred on dry roads.

Table 7.1

Casualty Collisions Involving Motorcycles
1985-1989

	1989	1988	1987	1986	1985
Number Of Motorcycles					
Fatal	12	31	31	33	33
Non-Fatal Injury	586	774	861	989	896
Total Number of Motorcycles	**598**	**805**	**892**	**1022**	**929**
Casualties*					
Number Killed	11	31	32	33	32
Number Injured	675	925	1029	1156	1099
Total Casualties in Collisions Involving Motorcycles	**686**	**956**	**1061**	**1189**	**1131**
Number of Motorcycles Involved in Casualty Collisions Per 10,000 Registered Motorcycles **					
Fatal Collisions	3.2	7.3	6.8	7.1	5.5
Non-Fatal Injury Collisions	154.8	182.2	190.0	212.7	150.2

Observations

Based on motorcycle registrations, the involvement rate of motorcycles in fatal collisions decreased to a five year low.

* This refers to the total number of people killed and injured in collisions in which a motorcycle was involved. It does not refer to the number of motorcyclists killed and injured.

** Source: Based on vehicle registration statistics, Motor Vehicles Division, Alberta Solicitor General, March 31, 1989.

NUMBER OF MOTORCYCLES INVOLVED IN FATAL COLLISIONS, Alberta 1985-1989 RATE PER 10,000 REGISTERED MOTORCYCLES

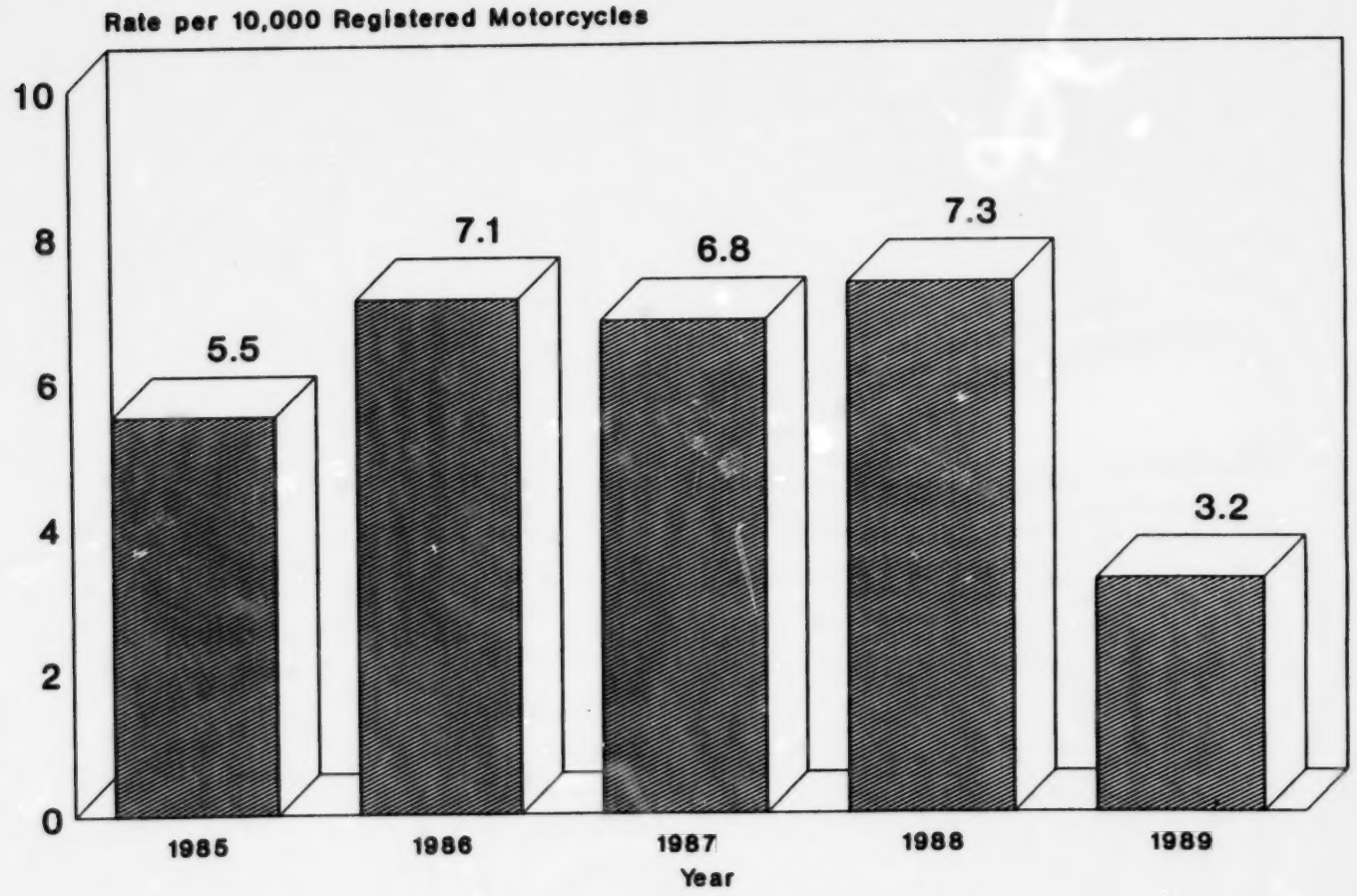


Figure 6

Table 7.2

Casualty Collisions Involving Motorcycles:
Age and Sex of Motorcycle Driver
1989

Age of Motorcycle Driver	Male		Female		Total*		Rate Per 1,000 Licensed Motorcycle Drivers**
	N	%	N	%	N	%	
Under 16	23	3.8	2	0.3	25	4.2	-
16 - 17	39	6.5	4	0.7	43	7.2	82.4
18 - 19	68	11.4	2	0.3	70	11.7	36.7
20 - 24	159	26.6	9	1.5	168	28.1	12.6
25 - 34	176	29.4	6	1.0	182	30.4	2.9
35 - 44	73	12.2	6	1.0	79	13.2	1.6
45 - 54	17	2.8	-	-	17	2.8	1.1
55 - 64	4	0.7	-	-	4	0.7	0.6
65 and over	1	0.2	-	-	1	0.2	0.4
Unspecified	5	0.8	-	-	9	1.5	
Total Number of Motorcycle Drivers	**565**	**94.4**	**29**	**4.8**	**598**	**100.0**	

Observations

The majority of motorcycle casualty collisions involved male drivers. Motorcycle drivers under the age of 25 were the age group most likely to be involved in collisions. In particular, 16 and 17 year old motorcycle drivers had a high involvement rate. The age group least likely to be involved in collisions were motorcyclists 65 years of age and over. These age and sex comparisons are limited due to the lack of driving exposure data. That is, in order to make valid age comparisons, it is important to take into account the number of kilometres driven annually by each age and sex group of motorcycle operators.

Note: In Alberta, Class 6 (motorcycle) licences are not issued to operators under 16 years of age.

* Total includes drivers whose sex was not specified on the collision report form.

** Source: Alberta Solicitor General - Motor Vehicles Division. Operator Statistics, December 31, 1989.

Table 7.3

Casualty Collisions Involving Motorcycles: Action of Motorcycle Driver* 1989

Action of Motorcycle Driver	N	%	Driver Action in Total Casualty Collisions (All Vehicle Types) %
Driving Properly	255	46.2	46.7
Unsafe Speed	87	15.8	5.9
Ran Off Road	52	9.4	7.2
Followed Too Closely	24	4.3	5.7
Failed to Observe Traffic Control Device	17	3.1	6.1
Improper Passing	12	2.2	0.7
Entered Lane When Unsafe	8	1.4	2.1
Improper Turn	7	1.3	1.5
Left Turn Across Path	6	1.1	5.0
Failed to Yield Right of Way	3	0.5	4.9
Left of Centre	3	0.5	1.5
Other	78	14.1	12.0
Total Number of Motorcycle Drivers	**552**	**100.0**	

Observations

Improper driver actions were a contributory factor for 53.8% of the motorcyclists involved in casualty collisions. Compared to drivers involved in total casualty collisions, motorcycle drivers were more likely to drive at an unsafe speed, run off the road, or pass improperly. However, motorcycle drivers were less likely to fail to yield right-of-way, to fail to observe a traffic control device, or make a left turn across the path of an oncoming vehicle.

* Based on those cases where driver action was specified on the collision report form.

Table 7.4

Casualty Collisions Involving Motorcycles:
Condition of Motorcycle Driver*
1989

Condition of Motorcycle Driver	N	%	Driver Condition in Total Casualty Collisions (All Vehicle Types) %
Normal	466	85.4	88.5
Had Been Drinking	52	9.5	5.6
Alcohol Impaired	23	4.2	4.3
Other	5	0.9	1.6
Total Number of Motorcycle Drivers	**546**	**100.0**	

Observations

The motorcycle driver's condition was a contributory factor for 14.6% of these crashes. Compared to drivers involved in other types of vehicle casualty collisions, motorcycle drivers were more likely to have consumed alcohol prior to the crash.

* Based on those cases where driver condition was specified on the collision report form.

Table 7.5

Casualty Collisions Involving Motorcycles:
Vehicular Factors*
1989

Vehicular Factors	N	%	Vehicular Factors in Total Casualty Collisions (All Vehicle Types) %
No Defect Present	508	96.0	98.0
Tire Failure/Inadequate	7	1.3	0.5
Lighting Defect	3	0.6	0.2
Defective Brakes	3	0.6	0.4
Other	8	1.5	0.9
Total Number of Motorcycles	**529**	**100.0**	

Observations

Vehicular factors were involved in 4.0% of motorcycle casualty collisions, compared to 2.0% in casualty collisions involving other types of vehicles. In particular, motorcycles were over two times as likely as other vehicle types to experience tire failure and three times as likely to have lighting defects.

* Based on those cases where a vehicular factor was specified on the collision report form.

Table 7.6

Casualty Collisions Involving Motorcycles:
Month of Occurrence
1989

Month	N	%
January	0	0.0
February	1	0.2
March	4	0.7
April	60	10.3
May	76	13.0
June	112	19.2
July	131	22.4
August	94	16.1
September	62	10.6
October	40	6.8
November	3	0.5
December	1	0.2
Total Number of Collisions	**584**	**100.0**

Observations

The months of June to August recorded the highest proportion of casualty crashes involving motorcycles.

Table 7.7

Casualty Collisions Involving Motorcycles:
Road Surface Condition*
1989

Road Surface Condition	N	%
Dry	455	84.6
Loose Material	41	7.6
Wet	39	7.2
Snowy/Icy	1	0.2
Other	2	0.4
Total Number of Collisions	**538**	**100.0**

Observations

The majority of casualty collisions involving motorcycles occurred on dry roads. However, 7.2% of the collisions occurred on wet road surfaces. Loose material on the road surface was involved in 7.6% of motorcycle casualty crashes.

* Based on those cases where road surface condition was specified on the collision report form.

Special Types of Vehicles

Tractor-Trailers

- In 1989, there were 58 persons killed and 555 injured in collisions involving tractor- trailers. This represents a decrease in casualties from 1988.
- Compared to drivers of other vehicles, tractor-trailer drivers were more likely to run off the road or pass improperly.
- Tractor-trailer drivers were less likely to consume alcohol before the crash than were drivers in total casualty collisions.
- Vehicular factors were more likely to be present in tractor-trailer casualty collisions than in total casualty collisions.
- The occurrence of casualty collisions involving tractor-trailers was highest in the months of August, September, and November.

Table 7.8

Casualty Collisions Involving Tractor-Trailers
1985-1989

Number of Tractor-Trailers	1989	1988	1987	1986	1985
Fatal	51	41	55	53	63
Non-Fatal Injury	383	392	359	425	433
Total Number of Tractor-Trailers	**434**	**433**	**414**	**478**	**496**
Casualties*					
Number Killed	58	52	63	65	86
Number Injured	555	569	529	607	646
Total Casualties in Collisions Involving Tractor-Trailers	**613**	**621**	**592**	**672**	**732**

Observations

In 1989, there were 58 persons killed and 555 injured in collisions involving tractor-trailers. This represents an decrease in casualties from 1988. The total number of tractor-trailers involved in casualty crashes increased slightly in 1989, standing at 434 compared to the five-year high of 496 recorded in 1985.

* This refers to the total number of people killed and injured in collisions in which a tractor-trailer was involved. It does not refer to the number of tractor-trailer drivers killed and injured.

Table 7.9

Casualty Collisions Involving Tractor-Trailers:
Driver Action*
1989

Driver Action	N	%	Driver Action In Total Casualty Collisions (All Types of Vehicles) %
Driving Properly	204	51.9	46.7
Ran Off Road	48	12.2	7.2
Failed to Observe Traffic Control Device	24	6.1	6.1
Unsafe Speed	23	5.9	5.9
Followed Too Closely	18	4.6	5.7
Entered Lane When Unsafe	13	3.3	2.1
Failed to Yield Right-of-Way	7	1.8	4.9
Improper Passing	5	1.3	0.7
Improper Turn	4	1.0	1.5
Left Turn Across Path	4	1.0	5.0
Backed Unsafely	4	1.0	0.6
Left of Center	2	0.5	1.5
Other	37	9.4	12.0
Total Number of Drivers	**393**	**100.0**	

Observations

Improper driver actions were exhibited by approximately 48.1% of the tractor-trailer drivers involved in casualty collisions. Compared to drivers of other vehicles, tractor-trailer drivers were more likely to run off the road, enter a lane when unsafe, or pass improperly. However, operators of tractor-trailers were less likely than other vehicle operators to fail to yield the right-of-way, or make an unsafe left turn.

* Based on those cases where driver action was specified on the collision report form.

Table 7.10

Casualty Collisions Involving Tractor-Trailers:
Driver Condition*
1989

Driver Condition	N	%	Driver Condition in Total Casualty Collisions (All Vehicle Types) %
Normal	365	95.1	88.5
Had Been Drinking	4	1.0	5.6
Alcohol Impaired	6	1.6	4.3
Other	9	2.3	1.6
Total Number of Drivers	**384**	**100.0**	

Observations

The condition of the tractor-trailer driver was a contributory factor for only 4.9% of the drivers involved. Tractor-trailer drivers were less likely to consume alcohol before the crash than were drivers involved in total casualty collisions.

* Based on those cases where driver condition was specified on the collision report form.

Table 7.11

Casualty Collisions Involving Tractor-Trailers:
Vehicular Factors*
1989

Vehicular Factors	N	%	Vehicular Factors in Total Casualty Collisions (All Vehicle Types) %
No Defect Present	361	96.5	98.0
Tire Failure/Inadequate	4	1.1	0.5
Defective Brakes	3	0.8	0.4
Lighting Defect	1	0.3	0.2
Other	5	1.3	
Total Number of Tractor-Trailers	**374**	**100.0**	

Observations

Vehicular factors were involved in 3.5% of tractor-trailer casualty collisions. Vehicular factors were more likely to be present in tractor-trailer collisions than in total casualty collisions.

* Based on those cases where a vehicular factor was specified on the collision report form.

Table 7.12

Casualty Collisions Involving Tractor-Trailers:
Month of Occurrence
1989

Month	N	%
January	38	9.2
February	30	7.3
March	27	6.4
April	20	4.8
May	34	8.2
June	32	7.7
July	35	8.5
August	41	9.9
September	43	10.4
October	30	7.3
November	44	10.7
December	39	9.4
Total Number of Collisions	**413**	**100.0**

Observations

The occurrence of casualty collisions involving tractor-trailers was highest in the months of August, September, and November. The lowest number of tractor-trailer casualty collisions occurred during March and April.

Special Types of Vehicles

Trains

- In 1989, 20 people were killed and 43 people were injured in crashes in which a train was involved. The number of casualties involving trains has increased from 1988.
- The largest number of casualty collisions involving trains occurred in the month of November.
- A large percentage of drivers involved in a collision with a train either failed to observe the traffic control device (50.0%) or failed to yield right-of-way (14.3%).

Table 7.13

Casualty Collisions Involving Trains
1985-1989

Number of Trains	1989	1989	1987	1986	1985
Fatal	15	8	4	3	5
Non-Fatal Injury	29	31	31	22	30
Total Number of Trains	**44**	**39**	**35**	**25**	**35**
Casualties*					
Number Killed	20	11	4	3	6
Number Injured	43	43	42	30	41
Total Casualties in Collisions Involving Trains	**63**	**54**	**46**	**33**	**47**

Observations

The number of trains involved in casualty collisions increased from 1988. The number of casualties resulting from these collisions has also increased since 1988.

* This refers to the total number of people killed and injured in collisions involving a train.

Table 7.14

Casualty Collisions Involving Trains:
Month of Occurrence
1989

Month	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
	N	%	N	%	N	%
January	1	6.7	2	6.9	3	6.8
February	2	13.3	3	10.3	5	11.4
March	-	-	2	6.9	2	4.5
April	-	-	2	6.9	2	4.5
May	2	13.3	-	-	2	4.5
June	-	-	2	6.9	2	4.5
July	2	13.3	4	13.8	6	13.6
August	2	13.3	-	-	2	4.5
September	-	-	3	10.3	3	6.8
October	2	13.3	3	10.3	5	11.4
November	2	13.3	8	27.6	10	22.7
December	2	13.3	-	-	2	4.5
Total Number of Collisions	**15**	**100.0**	**29**	**100.0**	**44**	**100.0**

Observations

The largest number of casualty collisions involving trains occurred in the month of November.

Table 7.15

Casualty Collisions Involving Trains:
Driver Action*
1989

Driver Action	Drivers in Fatal Collisions		Drivers In Non-Fatal Injury Collisions		Total Drivers in Casualty Collisions	
	N	%	N	%	N	%
Failed to Observe Traffic Control Device	9	64.3	12	42.9	21	50.0
Failed to Yield Right-of-Way	3	21.4	3	10.7	6	14.3
Unsafe Speed	-	-	4	14.3	4	9.5
Entered Lane When Unsafe	-	-	1	3.6	1	2.4
Other	2	14.3	8	28.6	10	23.8
Total Number of Drivers	**14**	**100.0**	**28**	**100.0**	**42**	**100.0**

Observations

A large percentage of drivers involved in collision with a train either failed to observe the traffic control device (50.0%) or failed to yield right-of-way (14.3%).

* Based on those cases where driver action was specified on the collision report form.

PEDESTRIANS AND BICYCLISTS

PEDESTRIANS

- Pedestrian casualty collisions were fairly evenly distributed across all months of the year. January, September and November accounted for the largest number of collisions, while April experienced the least number of pedestrian crashes.
- Pedestrian casualty collisions were most likely to occur on Fridays and least likely to occur on Sundays.
- Pedestrian casualty collisions were most likely to occur during the evening rush-hour period. (3:00 p.m. to 6:59 p.m.).
- 25.8% of the drivers in collisions involving a pedestrian were recorded as failing to yield the right-of-way.
- The casualty rate per population was highest for pedestrians between the ages of 5 and 19.

Table 8.1

Casualty Collisions Involving Pedestrians:
Month of Occurrence
1989

Month of Collision	N	%
January	123	9.9
February	93	7.5
March	89	7.2
April	88	7.1
May	101	8.1
June	100	8.1
July	91	7.3
August	94	7.6
September	123	9.9
October	110	8.9
November	120	9.7
December	108	8.7
Total Number of Collisions	**1240**	**100.0**

Observations

Pedestrian casualty collisions were fairly evenly distributed across all months of the year. January, September and November accounted for the largest number of collisions, while April experienced the least number of pedestrian crashes.

Table 8.2

Casualty Collisions Involving Pedestrians:
Day of Week
1989

Day of Week	N	%
Monday	165	13.3
Tuesday	192	15.5
Wednesday	186	15.0
Thursday	174	14.0
Friday	234	18.9
Saturday	178	14.4
Sunday	111	9.0
Total Number of Collisions	**1240**	**100.0**

Observations

Pedestrian casualty collisions were most likely to occur on Fridays and least likely to occur on Sundays.

Table 8.3

Casualty Collisions Involving Pedestrians:
Time Period
1989

Time Period	N	%
11:00 p.m. - 2:59 a.m.	110	8.9
3:00 a.m. - 6:59 a.m.	29	2.3
7:00 a.m. - 10:59 a.m.	205	16.5
11:00 a.m. - 2:59 p.m.	242	19.5
3:00 p.m. - 6:59 p.m.	432	34.8
7:00 p.m. - 10:59 p.m.	202	16.3
Unspecified	20	1.6
Total Number of Collisions	**1240**	**100.0**

Observations

Pedestrian casualty collisions were most likely to occur during the evening rush-hour period from 3:00 p.m. to 6:59 p.m. These collisions were least likely to occur during the early morning hours.

Table 8.4

Casualty Collisions Involving Pedestrians:
Location
1989

Location	N	%
Urban	1169	94.3
Rural	71	5.7
Total Number of Collisions	**1240**	**100.0**

Observations

The majority of pedestrian casualty collisions (94.3%) occurred in urban areas. Only 5.7% occurred in rural areas.

Table 8.5

Casualty Collisions Involving Pedestrians:
Driver Action
1989

Driver Action	N	%	Driver Action in Total Casualty Collisions (All Vehicle Types) %
Driving Properly	490	45.4	46.7
Failed to Yield Right-of-Way	279	25.8	4.9
Backed Unsafely	40	3.7	0.6
Failed to Observe Traffic Control Device	36	3.3	6.1
Unsafe Speed	27	2.5	5.9
Improper Passing	15	1.4	0.7
Ran Off Road	11	1.0	7.2
Improper Turn	7	0.6	1.5
Left Turn Across Path	7	0.6	5.0
Entered Lane When Unsafe	5	0.5	2.1
Left of Center	3	0.3	1.5
Other	160	14.8	12.0
Total Number of Drivers	**1080**	**100.0**	

Observations

45.4% of the drivers involved in pedestrian crashes were recorded as driving properly. However, compared to total casualty collisions, drivers involved in pedestrian casualty collisions were over five times as likely to fail to yield right of way (25.8%).

* Based on those cases where a driver action was specified on the collision report form.

Table 8.6

Age of Pedestrian Casualties
1989

Age in Years	Pedestrians Killed N	Pedestrians Injured N	Total Pedestrian Casualties N	%	Pedestrian Casualty Rate Per 10,000 Population
Under 5	3	58	61	4.9	3.0
5 - 9	3	161	164	13.1	8.6
10 - 14	3	130	133	10.6	7.6
15 - 19	4	177	181	14.5	10.0
20 - 24	4	123	127	10.2	6.5
25 - 29	6	102	108	8.6	4.5
30 - 34	4	92	96	7.7	4.0
35 - 44	4	98	102	8.2	2.7
45 - 54	6	74	80	6.4	3.5
55 - 64	7	62	69	5.5	3.8
65 and over	15	94	109	8.7	5.1
Unspecified	-	21	21	1.7	-
Total Number of Pedestrian Casualties	**59**	**1192**	**1251**	**100.0**	

Observations

The casualty rate per population was highest for pedestrians between the ages of 5 and 19. In particular, pedestrians aged 15 to 19 had the highest casualty rate. The lowest casualty rate was recorded for persons aged 35 to 44 years. The greatest number of fatalities was in the age group 65 and over.

*Source - Based on estimates of the Alberta population by age groups and sex, June 1, 1989, Statistics Canada.

PEDESTRIAN CASUALTIES
CASUALTY RATE PER 10,000 POPULATION
Alberta, 1989

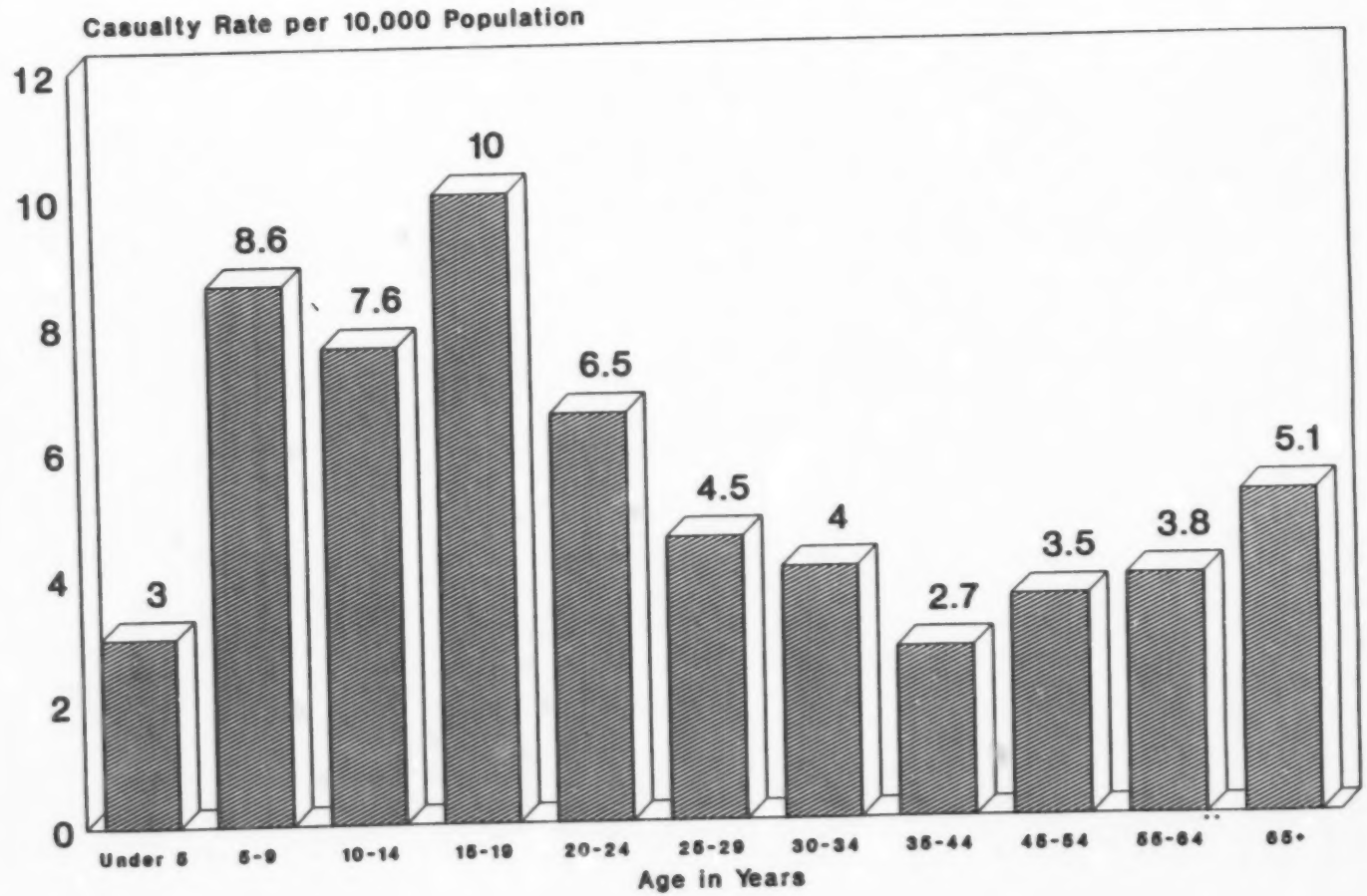


Figure 7

Pedestrians and Bicyclists

BICYCLISTS

- Casualty collisions involving bicycles were more likely to occur between the months of May and September.
- Fridays experienced the most casualty collisions involving bicycles. As well, the largest number of these crashes (42.9%) occurred during the evening rush-hour period.
- The majority of bicycle casualty crashes involved young bicyclists, 10-19 years of age.
- An improper action on the part of the bicyclist was recorded for nearly 65% of those involved in casualty crashes. The most commonly cited bicyclist actions were failing to yield the right-of-way, failing to observe a traffic control device, and entering a lane when unsafe.

Table 8.7

Casualty Collisions Involving Bicycles:
Month of Occurrence
1989

Month	N	%
January	4	0.6
February	-	-
March	6	1.0
April	60	9.6
May	83	13.2
June	123	19.6
July	97	15.5
August	92	14.7
September	91	14.5
October	52	8.3
November	17	2.7
December	2	0.3
Total Number Of Collisions	**627**	**100.0**

Observations

The majority of casualty crashes involving bicycles occurred during the months of May to September.

Table 8.8

Casualty Collisions Involving Bicycles:
Day of Week
1989

Day of Week	N	%
Monday	93	14.8
Tuesday	96	15.3
Wednesday	94	15.0
Thursday	86	13.7
Friday	113	18.0
Saturday	72	11.5
Sunday	73	11.6
Total Number of Collisions	**627**	**100.0**

Observations

Casualty collisions involving bicycles were more likely to occur on Fridays.

Table 8.9

Casualty Collisions Involving Bicycles:
Time Period
1989

Time Period	N	%
11:00 p.m. - 2:59 a.m.	22	3.5
3:00 a.m. - 6:59 a.m.	8	1.3
7:00 a.m. - 10:59 a.m.	68	10.8
11:00 a.m. - 2:59 p.m.	121	19.3
3:00 p.m. - 6:59 p.m.	269	42.9
7:00 p.m. - 10:59 p.m.	130	20.7
Unspecified	9	1.4
Total Number of Collisions	**627**	**100.0**

Observations

The largest proportion of casualty crashes (42.9%) involving bicycles occurred over the evening rush-hour period of 3:00 p.m. - 6:59 p.m.

Table 8.10

Casualty Collisions Involving Bicycles:
Age and Sex of Bicyclist
1989

Age of Bicyclist	Male		Female		Total*	
	N	%	N	%	N	%
Under 5	7	1.1	1	0.2	8	1.3
5 - 9	80	12.6	24	3.8	106	16.7
10 - 14	84	13.3	47	7.4	132	20.8
15 - 19	95	15.0	36	5.7	133	21.0
20 - 24	56	8.8	19	3.0	75	11.8
25 - 29	32	5.1	10	1.6	42	6.6
30 - 34	23	3.6	9	1.4	34	5.4
35 - 44	22	3.5	4	0.6	26	4.1
45 - 54	7	1.1	1	0.2	8	1.3
55 - 64	3	0.5	-	-	3	0.5
65 and over	8	1.3	1	0.2	9	1.4
Unspecified	26	4.1	19	3.0	57	9.0
Total Number of Bicyclists	**443**	**70.0**	**171**	**27.0**	**633**	**100.0**

Observations

The majority of bicycle casualty collisions involved male bicyclists. The 10-19 year old age group was most frequently involved in these collisions.

* Total includes bicyclists whose sex was not specified on the collision report form.

Table 8.11

Casualty Collisions Involving Bicycles:
Action of Bicyclist*
1989

Action of Bicyclist	N	%	Driver Action In Total Casualty Collisions (All Vehicle Types) %
Driving Properly	201	35.4	46.7
Failed to Yield Right-of-Way	69	12.1	4.9
Failed to Observe Traffic Control Device	35	6.2	6.1
Entered Lane When Unsafe	35	6.2	2.1
Left Turn Across Path	14	2.5	5.0
Left of Center	14	2.5	1.5
Improper Turn	9	1.6	1.5
Unsafe Speed	6	1.1	5.9
Improper Passing	6	1.1	0.7
Followed Too Closely	5	0.9	5.7
Failed to Signal	3	0.5	0.1
Ran Off Road	3	0.5	7.2
Other	168	29.6	12.0
Total Number of Bicyclists	**568**	**100.0**	

Observations

An improper action on the part of the bicyclist was recorded for nearly 65% of those involved in casualty crashes. Compared to operators of all vehicles in casualty collisions, bicyclists were more likely to fail to yield right-of-way or enter a lane when unsafe.

* Based on those cases where driver action was specified on the collision report form.

Traffic Safety Issues

Alcohol Involvement

- A total of 9.5% of drivers involved in injury crashes were judged to have consumed alcohol prior to the crash, compared to 25.0% of drivers involved in fatal collisions. As the severity of the collision increased, the involvement of alcohol dramatically increased.

- In terms of involvement per 1,000 licensed drivers, males between 18 and 21 years of age were most likely to have been drinking before the crash. There were over five and a half times as many male drivers as female drivers who had consumed alcohol prior to the collision.

- In 1989, alcohol related casualty crashes were most likely to have occurred between June to October, on Saturday, and between 11:00 p.m. and 2:59 a.m.

- Figure 8 provides a graphic representation of the involvement of drinking drivers in casualty collisions over the past five years, 1985-1989.

Table 9.1

Condition of Drivers in Casualty Collisions*
1989

Condition of Driver	Drivers in Fatal Collisions N	Drivers in Fatal Collisions %	Drivers in Non-Fatal Injury Collisions N	Drivers in Non-Fatal Injury Collisions %	Total Drivers in Casualty Collisions N	Total Drivers in Casualty Collisions %
Normal	410	72.7	18084	88.9	18494	88.5
Had Been Drinking	75	13.3	1099	5.4	1174	5.6
Alcohol Impaired	66	11.7	839	4.1	905	4.3
Total Alcohol Involvement	**141**	**25.0**	**1938**	**9.5**	**2079**	**9.9**
Other	13	2.3	313	1.5	326	1.6
Total Number of Drivers	**564**	**100.0**	**20335**	**100.0**	**20899**	**100.0**

Observations

Of drivers involved in injury collisions, 9.5% had consumed alcohol before the crash, compared to 25.0% in fatal collisions. As the severity of the collision increased, the involvement of alcohol dramatically increased. Overall, 9.9% of drivers involved in casualty collisions were judged to have consumed alcohol before the crash.

* Based on those cases where driver condition was specified on the collision report form.

INVOLVEMENT OF DRINKING DRIVERS IN CASUALTY COLLISIONS Alberta, 1985-1989

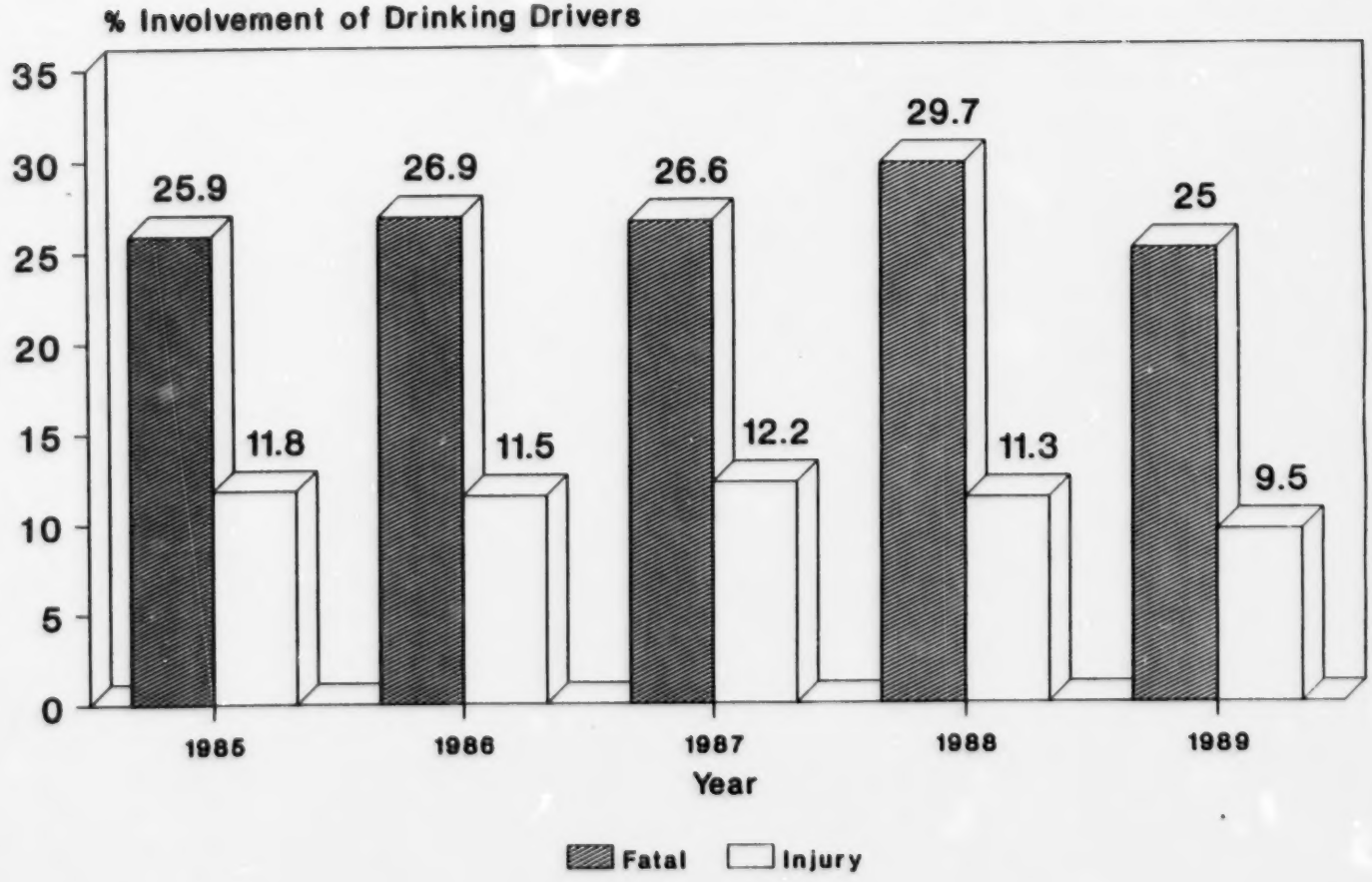


Figure 8

DRIVER CONDITION IN CASUALTY COLLISIONS
Alberta, 1989

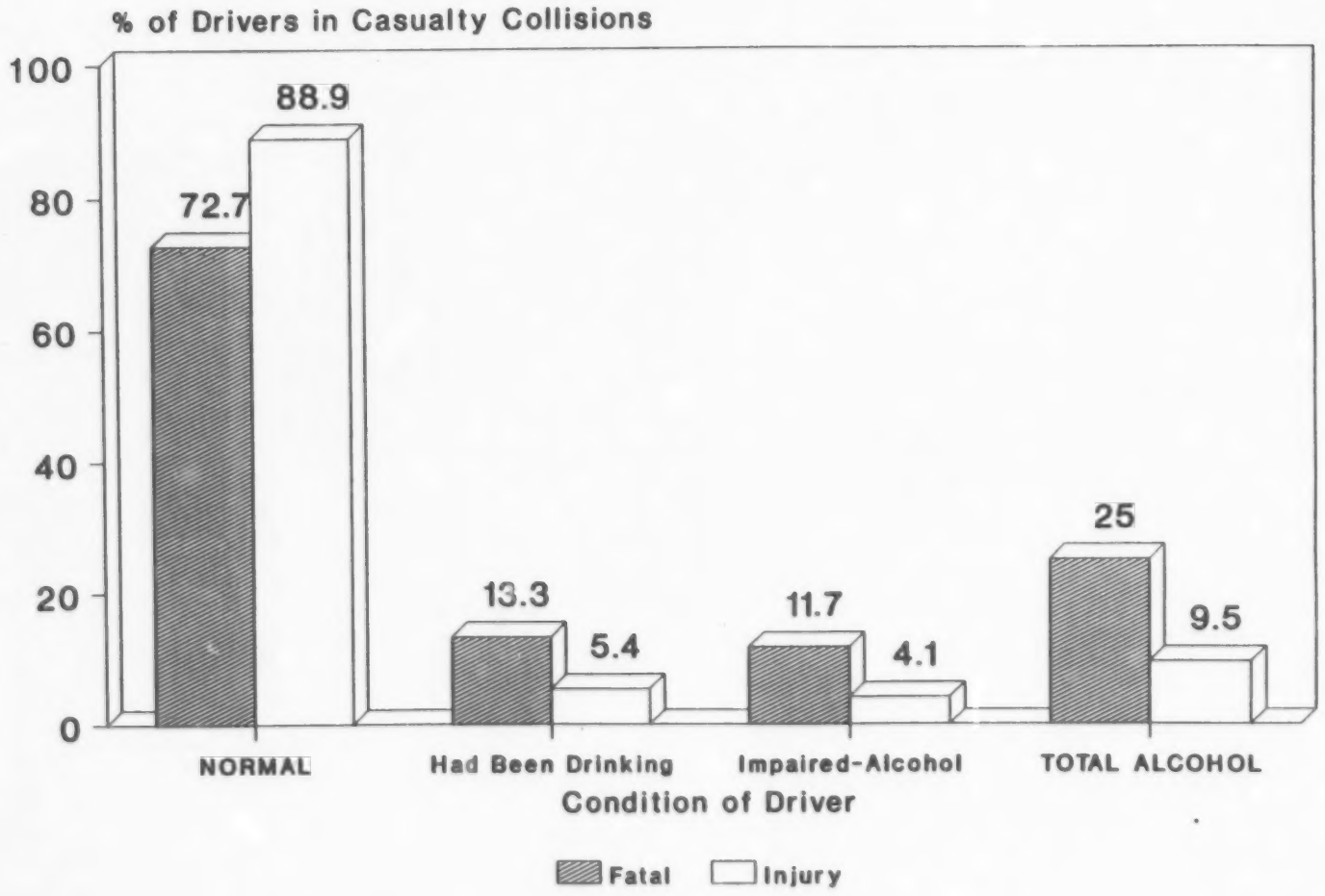


Figure 9

Table 9.2

Alcohol-Involved Casualty Collisions:
Age and Sex of Drinking Drivers
1989

	Male			Female			Total*		
Age in Years	N	%	Rate Per 1000** Licensed Drivers	N	%	Rate Per 1000** Licensed Drivers	N	%	Rate Per 1000** Licensed Drivers
Under 16	10	0.5	0.6	2	0.1	0.2	13	0.6	0.5
16 - 17	91	4.4	3.1	17	0.8	0.7	109	5.2	2.0
18 - 19	181	8.7	4.7	37	1.8	1.1	221	10.6	3.1
20 - 21	163	7.8	4.1	27	1.3	0.7	190	9.1	2.5
22 - 24	231	11.1	3.4	38	1.8	0.6	269	12.9	2.1
25 - 29	349	16.7	2.4	77	3.7	0.6	428	20.5	1.6
30 - 34	231	11.1	1.6	56	2.7	0.4	289	13.8	1.0
35 - 44	289	13.8	1.3	41	2.0	0.2	332	15.9	0.8
45 - 54	104	5.0	0.8	10	0.5	0.1	114	5.5	0.5
55 - 64	46	2.2	0.5	7	0.3	0.1	53	2.5	0.3
65 and over	33	1.6	0.4	1	0.0	0.0	34	1.6	0.3
Unspecified	13	0.6		1	0.0		34	1.6	
TOTAL	**1741**	**83.5**		**314**	**15.0**		**2086**	**100.0**	
Number of Drivers									

Observations

Of those collision-involved drivers who had consumed alcohol, there were five and a half times as many male drivers as female drivers. The majority were male drivers under the age of 30. In terms of involvement per 1,000 licensed drivers, males 18-21 years of age are more likely to have consumed alcohol prior to a casualty collision than any other age group. After the age of 30, alcohol involvement decreased for both male and female drivers.

Drinking drivers include those indicated on the collision report form as having been drinking prior to the crash and those who were alcohol-impaired at the time of the crash. Whether or not the driver was actually charged is not taken into consideration by the collision report form.

*Total includes drinking drivers whose sex was not specified on the collision report form.

**Source: Alberta Solicitor General - Motor Vehicles Division. Operator Statistics, December 31, 1989.

AGE AND SEX OF DRINKING DRIVERS INVOLVED IN CASUALTY COLLISIONS, Alberta 1989
COLLISION RATE PER 1000 LICENSED DRIVERS

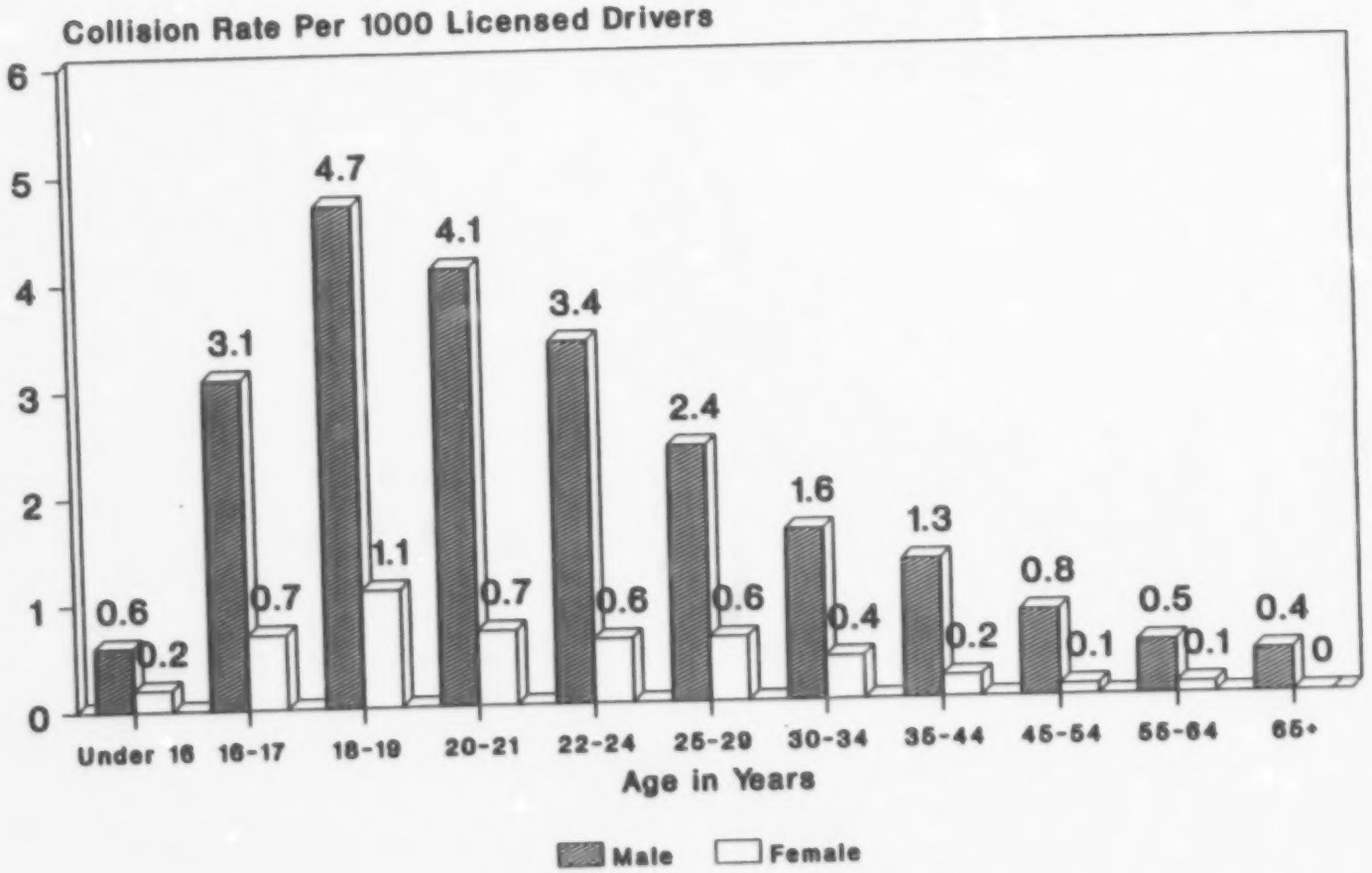


Figure 10

Table 9.3

Alcohol-Involved Casualty Collisions:
Month of Occurrence
1989

	Fatal Co'lisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
Month	**N**	**%**	**N**	**%**	**N**	**%**
January	4	3.0	96	5.1	100	5.0
February	7	5.3	109	5.8	116	5.8
March	4	3.0	136	7.3	140	7.0
April	13	9.8	158	8.5	171	8.6
May	12	9.1	150	8.0	162	8.1
June	12	9.1	177	9.5	189	9.5
July	14	10.6	193	10.3	207	10.4
August	12	9.1	177	9.5	189	9.5
September	11	8.3	186	10.0	197	9.9
October	20	15.2	177	9.5	197	9.9
November	10	7.6	177	9.5	187	9.4
December	13	9.8	131	7.0	144	7.2
Total Number of Collisions	**132**	**100.0**	**1867**	**100.0**	**1999**	**100.0**

Observations

The months of June to October accounted for the largest proportion of alcohol-involved casualty collisions. The months of January and February accounted for the smallest proportion of alcohol-involved casualty collisions.

Table 9.4

Alcohol-Involved Casualty Collisions:
Day of Week
1989

	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
Day Of Week	**N**	**%**	**N**	**%**	**N**	**%**
Monday	5	3.8	132	7.1	137	6.9
Tuesday	15	11.4	173	9.3	188	9.4
Wednesday	10	7.6	174	9.3	184	9.2
Thursday	12	9.1	222	11.9	234	11.7
Friday	25	18.9	324	17.4	349	17.5
Saturday	32	24.2	511	27.4	543	27.2
Sunday	33	25.0	331	17.7	364	18.2
Total Number of Collisions	**132**	**100.0**	**1867**	**100.0**	**1999**	**100.0**

Observations

The highest number of alcohol-involved fatal collisions occurred on Saturdays and Sundays (24.2% and 25.0%). The highest number of non-fatal injury collisions occurred on Saturdays (27.4%). The smallest number of alcohol-involved casualty collisions occurred on Mondays.

Table 9.5

Alcohol-Involved Casualty Collisions:
Time Period
1989

	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
Time of Day	**N**	**%**	**N**	**%**	**N**	**%**
11:00 p.m. - 2:59 a.m.	46	34.8	609	32.6	655	32.8
3:00 a.m. - 6:59 a.m.	23	17.4	289	15.5	312	15.6
7:00 a.m. - 10:59 a.m.	7	5.3	87	4.7	94	4.7
11:00 a.m. - 2:59 p.m.	4	3.0	86	4.6	90	4.5
3:00 p.m. - 6:59 p.m.	13	9.8	292	15.6	305	15.3
7:00 p.m. - 10:59 p.m.	36	27.3	459	24.6	495	24.8
Unspecified	3	2.3	45	2.4	48	2.4
Total Number of Collisions	**132**	**100.0**	**1867**	**100.0**	**1999**	**100.0**

Observations

The late night/early morning time period (11:00 p.m. - 2:59 a.m.) was most likely to record alcohol-involved casualty collisions (32.8%). The mid-day hours (11:00 a.m. - 2:59 p.m.) were least likely to record alcohol-involved casualty crashes (4.5%).

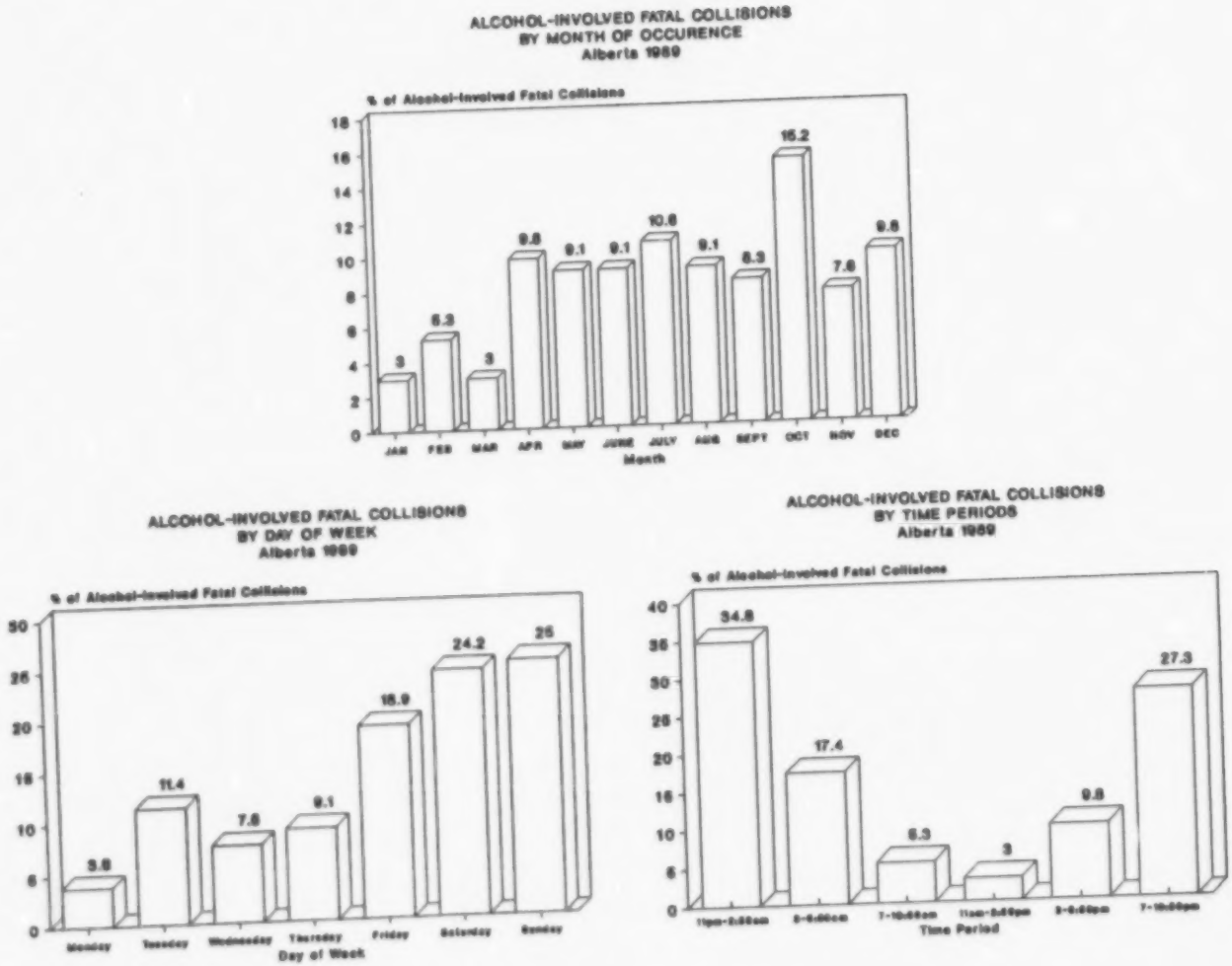

ALCOHOL-INVOLVED FATAL COLLISIONS
BY MONTH OF OCCURENCE
Alberta 1989
% of Alcohol-Involved Fatal Collisions
18
16
14
12
10
8
6
4
2
0
3
6.3
3
9.8
9.1
9.1
10.8
9.1
8.3
15.2
7.6
9.8
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
Month
ALCOHOL-INVOLVED FATAL COLLISIONS
BY DAY OF WEEK
Alberta 1989
% of Alcohol-Involved Fatal Collisions
30
25
20
15
10
5
0
3.8
11.4
7.6
9.1
18.9
24.2
25
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Day of Week
ALCOHOL-INVOLVED FATAL COLLISIONS
BY TIME PERIODS
Alberta 1989
% of Alcohol-Involved Fatal Collisions
40
35
30
25
20
15
10
5
0
34.8
17.4
6.3
3
9.8
27.3
11pm-3:59am
4-6:59am
7-10:59am
11am-3:59pm
4-6:59pm
7-10:59pm
Time Period

Figure 11

Traffic Safety Issues

Restraint Use

- The collision report form collects restraint use information for occupants killed or injured in a collision. The form does not collect restraint use information for individuals involved in a collision who were not killed or injured.
- As the percentage of restraint use increased, the severity of occupant injury decreased.
- For approximately 11 months of 1989, from February through December, Alberta's seat belt law was not enforced.

Table 9.6

Restraint Use of Occupant Casualties and Injury Severity 1989

Injury Severity	Percent Using Restraints*
Fatal	26.9
Major	29.5
Minor	51.0

Observations

The collision report form collects seat belt use for **killed and injured occupants only.** Most of the fatally injured occupants were not restrained at the time of the crash. As the percentage of seat belt use increased, the severity of occupant injury decreased.

For approximately 11 months of 1989, from February through December, Alberta's seat belt law was not enforced.

Injury Severity

Fatal -A fatal injury is a death of a person that occurs as a result of a motor vehicle collision within 30 days of the collision.

Major -Persons with injuries or complaint of pain that went to the hospital and were subsequently admitted even if for observation only.

Minor -Persons with injuries or complaint of pain that went to the hospital, were treated in emergency (or refused treatment) and SENT HOME without ever being admitted to the hospital.

*Based on those cases where occupant restraint use and injury severity was specified on the collision report form.